FORM PTO-1390 (REV. 12-2001) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY 'S DOCKET NUMBER: VWP-514-A

U.S. APPLICATION NO. (If known, see 37 CFR 1.5): 10/089798

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP00/04600	20 May 2000	4 October 1999

TITLE OF INVENTION: WIPING DEVICE

APPLICANT(S) FOR DO/EO/US: Bernd Walther

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [X] This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. [X] The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [X] is attached hereto (required only if not communicated by the International Bureau).
   b. [ ] has been communicated by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [X] An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. [X] is attached hereto.
   b. [ ] has been previously submitted under 35 U.S.C. 154(d)(4).
7. [ ] Amendments to the claims of the International Aplication under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are attached hereto (required only if not communicated by the International Bureau).
   b. [ ] have been communicated by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. [X] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] An English lanugage translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. [ ] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [X] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [X] A FIRST preliminary amendment.
14. [ ] A SECOND or SUBSEQUENT preliminary amendment.
15. [X] A substitute specification.
16. [ ] A change of power of attorney and/or address letter.
17. [ ] A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. [ ] A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. [ ] A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. [X] Other items or information: Red-Lined Specification

JC10 Rec'd PCT/PTO 03 APR 2002

U.S. APPLICATION NO (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO	ATTORNEY'S DOCKET NUMBER
Unknown 10/089798	PCT/EP00/04600	VWP-514-A

21. [X] The following fees are submitted:	CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$1040.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$890.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$740.00**		
International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) **$710.00**		
International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) **$100.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 890	
Surcharge of **$130.00** for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$ 0	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	8 - 20 =		x **$18.00**	$
Independent claims	1 - 3 =		x **$84.00**	$
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ **$280.00**	$ 0

TOTAL OF ABOVE CALCULATIONS =	$ 890	
[ ] Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2. +	$ 0	-
SUBTOTAL =	$ 890	
Processing fee of **$130.00** for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).	$ 0	
TOTAL NATIONAL FEE =	$ 890	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +	$ 40	
TOTAL FEES ENCLOSED =	$ 930	
	Amount to be refunded:	$
	charged:	$

a. [X] A check in the amount of $930.00 to cover the above fees is enclosed.

b. [ ] Please charge my Deposit Account No. _____ in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 25-0115 A duplicate copy of this sheet is enclosed.

d. [ ] Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

William M. Hanlon, Jr.
NAME

28422
REGISTRATION NUMBER

Our Reference: VWP-514-A PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Bernd Walther
Serial Number:	Unknown
Filing Date:	Concurrent
Examiner/Art Group Unit:	Unknown/Unknown
Title:	WIPING DEVICE

PRELIMINARY AMENDMENT

Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

If any charges or fees must be paid in connection with the following communication, they may be paid out of our Deposit Account No. 25-0115.

Prior to initial examination, please amend the above-identified patent application as indicated below.

In the specification:

After the claims, begin a new page and insert:

ABSTRACT

A wiping device for wiping window panes on vehicles includes a wiping motor, a gear mechanism situated on a drive shaft of the wiper motor, a gear housing which surrounds the gear mechanism, a gear housing cover which is situated on the gear housing, a gear output shaft and a crank which is located on the gear output shaft on the side of the gear housing facing away from the gear in a rotationally fixed manner. The connection between the gear output shaft and the crank is a press connection.

In the claims:

1. (Amended) A wiping device for wiping window glass on vehicles, having a wiper motor, a gear mechanism disposed on the input shaft of the wiper motor, a gear housing enclosing the gear mechanism, a gear housing cover disposed on the gear housing, an output shaft and a crank rotationally immovably positioned on the output shaft on a side of the gear housing facing away from the gear mechanism, characterized in that the output shaft-to-crank connection is a press fitting and that one of the gear housing and the gear housing cover has an opening on a side facing away form the crank, where an end of the output shaft facing away from the crank can be supported through the opening to press fit the output shaft to the crank.

2. (Amended) The wiping device in accordance with claim 1, wherein an inner part of the press fitting is the output shaft and an outer part of the press fitting is a cylindrical bore in the crank.

3. (Amended) The wiping device in accordance with claim 1, wherein the output shaft is staked to the crank.

4. (Amended) The wiping device in accordance with claim 3, wherein the cylindrical bore in the crank has a one of chamfer, a cylindrical depression and a recess on the side facing away from the gear housing.

5. (Amended) The wiping device in accordance with claim 1, wherein the output shaft on the side facing away from the crank extends into the area towards one of the gear housing and the gear housing cover and one of the gear housing and the gear housing cover has an opening in this area.

6. Please cancel claim 6.

7. (Amended) The wiping device in accordance with claim 1, wherein the opening is closed with a cover.

8. (Amended) A process for assembling a wiping device for wiping window glass on vehicles, having a wiper motor, a gear mechanism disposed on an input shaft of the wiper motor, a gear housing enclosing the gear mechanism, an output shaft and a crank rotationally immovably disposed on the output shaft, characterized by the output shaft is pressed into a cylindrical bore in the crank; and

in order to press fit the output shaft to the crank and the end of the output shaft facing away from the crank supports through an opening on one of the side of the gear housing and a gear housing cover facing away from the crank.

REMARKS

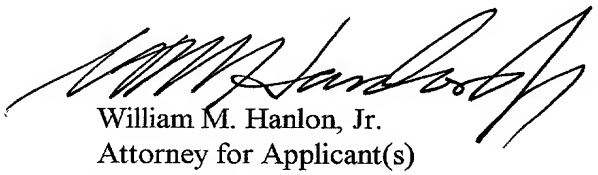
After entry of this amendment, claims 1-5, 7 and 8 have been amended. Claim 6 has been cancelled.

A handwritten, corrected copy of the specification is enclosed showing the changes which have been made to the specification as required by Section 608.01(Q) and 714.20(1) of the Manual of Patent Examining Procedure. The Substitute Specification filed herewith has been amended to utilize idiomatic English, correct minor typographical and grammatical errors and to conform the application to current United States patent practice. The Substitute Specification includes no new subject matter; but does include the same changes handwritten in red in the attached, corrected, original specification. Entry of the Substitute Specification is respectfully requested.

It is submitted that this Amendment has antecedent basis in the application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the application. Consideration of the application as amended is requested.

Respectfully submitted,

YOUNG, BASILE, HANLON, MacFARLANE, WOOD & HELMHOLDT, P.C.



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Dated: April 3, 2002
WMH/jao

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

1. (Amended) [Wiping] A wiping device [(1)] for wiping window glass on vehicles, having a wiper motor [(2)], a gear mechanism disposed on the input shaft of the wiper motor [(2)], a gear housing [(3)] enclosing the gear mechanism, a gear housing cover [(12)] disposed on the gear housing [(3)], an output shaft [(6)] and a crank [(8) positioned] rotationally [immovable] immovably positioned on the output shaft on [the] a side of the gear housing [(12)] facing away from the gear mechanism, characterized in that the output shaft-to-crank connection is a press fitting and that one of the gear housing and the gear housing cover has an opening on a side facing away form the crank, where an end of the output shaft facing away from the crank can be supported through the opening to press fit the output shaft to the crank.

2. (Amended) [Wiping] The wiping device [(1)] in accordance with claim 1, wherein [the] an inner part of the press fitting is the output shaft [(6)] and [the] an outer part of the press fitting is a cylindrical [hole (9) present] bore in the crank [(8)].

3. (Amended) [Wiping] The wiping device [(1)] in accordance with claim 1 [and 2], wherein the output shaft [(6)] is staked to the crank [(8)].

4. (Amended) [Wiping] The wiping device [(1)] in accordance with claim 3, wherein the cylindrical [hole (9)] bore in the crank has a one of chamfer, a cylindrical depression [or] and [an] a [otherwise shaped] recess on the side facing away from the gear housing [(3)].

5. (Amended) [Wiping] The wiping device [(1)] in accordance with [one of the preceding claims] claim 1, wherein the output shaft [(6)] on the side facing away from the crank [(8)] extends into the area towards one of the gear

housing [(3) or] and the gear housing cover [(12)] and one of the gear housing [(3) or] and the gear housing cover [(12)] has an opening in this area.

6. Please cancel claim 6.

7. (Amended) [Wiping] The wiping device in accordance with claim [6] 1, wherein the opening [can be] is closed [specifically] with a cover [(15)].

8. (Amended) [Process] A process for assembling a wiping device [(1)] for wiping window glass on vehicles, having a wiper motor [(2)], a gear mechanism disposed on [the] an input shaft of the wiper motor [(2)], a gear housing [(3)] enclosing the gear mechanism, an output shaft [(6)] and a crank [(8) disposed] rotationally [immovable] immovably disposed on the output shaft [(6)], characterized [in that] by the output shaft [(6)] is pressed into [and if necessary staked into] a cylindrical [hole (9)] bore [present] in the crank [(8), where] ; and

in order to press fit the output shaft to the crank and the end of the output shaft facing away from the crank supports through an opening on one of the side of the gear housing and a gear housing cover facing away from the crank.

Wiping Device

Description

The invention relates to a wiping device for wiping window glass on vehicles, having a wiper motor, a gear mechanism disposed on the input shaft of the wiper motor, a gear housing enclosing the gear mechanism, a gear housing cover disposed on the gear housing, an output shaft and a crank located rotationally immovable on the output shaft on the side of the gear housing facing away from the gear mechanism. The invention additionally relates to a process for attaching the crank to the output shaft.

According to the generally known prior art, the crank is secured rotationally immovable to the output shaft by means of a threaded connector. To do this, the crank is installed onto the end of the output shaft facing the crank by means of a hole present in the crank. The output shaft has a threaded section on its end onto which a retaining nut is threaded, by means of which the crank is frictionally connected to the output shaft.

Prior art of this type has the specific disadvantage that the retaining nut in its assembled state lies against the surface of the crank facing away from the gear housing. Because of the retaining nut, it is necessary to configure the crank in such a way that a wiper linkage connected to the crank at the free end of the crank by a swivel head is not obstructed by the retaining nut when the crank is rotating. In this situation, specific provision can be made for the crank to be bent in the direction away from the gear housing. To do this however, an extra bending step is required when making the crank, which is associated with complexity and cost. In addition, a bend of this type in the crank results in an uneven distribution of the compressive and tensile stresses in the crank because of the forces and torque to be transmitted with the crank.

The object of the invention is therefore to propose a wiping device in which a special configuration of the crank is not necessary because of the location of the crank on the output shaft. The crank is still to be connected permanently to the output shaft in a way that ensures functional reliability.

To accomplish the object, a wiping device of the type described at the beginning is proposed which envisions that the output shaft-to-crank connection is a press fitting.

A press fitting of this type has the specific advantage that no retaining nut on the surface of the crank facing away from the gear mechanism or any other retaining element is present to retain the crank on the output shaft. Instead, the end face of the output shaft ends flush with the crank, or does not extend beyond the surface of the crank. This renders a special configuration of the crank unnecessary because of a retaining element present on the surface of the crank. Under the invention the crank therefore does not need to be bent and can thus be configured flat.

In addition, an output shaft-to-crank connection in the form of a press fitting can be implemented easily and economically by mechanical means.

A further advantage of a connection of this type is that no additional components such as retaining nuts, threaded sections, washers or the like are needed to implement the output shaft-to-crank connection.

In a preferred embodiment of the invention the inner part of the press fitting is the output shaft and the outer part of the press fitting is a cylindrical hole present in the crank. A press fitting of this design has the advantage that the output shaft already has a round cross section, so that only a cylindrical hole with matching tolerances has to be made in the crank. The joining surfaces are thereby cylindrical.

In a further development of the invention it is envisioned that the output shaft is staked to the crank. With a stake fitting of this type, for example, the area of the end face of the output shaft is plastically deformed and thereby displaced in such a way that the output shaft, at least over a short section, marginally grips the crank, or the cylindrical hole in the crank respectively, from behind. In order to make staking of this kind possible, provision can be made for the free end of the output shaft to protrude a very small amount through the cylindrical hole on the side of the crank facing away from the gear housing and for the protruding section to be plastically deformed or displaced.

In a further development of the invention provision is made for the cylindrical hole in the crank on the side facing away from the gear housing to have a chamfer, a cylindrical depression or an otherwise shaped cutout. A cylindrical hole configured in this way has the advantage that the staked section of the output shaft can be accommodated by the chamfer, the cylindrical depression or the otherwise shaped cutout. In this way a smooth and flat surface on the crank is ensured even though the corresponding section of the output shaft is staked.

In another advantageous embodiment of the invention provision is made for the output shaft to extend into the area towards the gear housing or the gear housing cover on the side facing away from the crank, and for the gear housing or the gear housing cover to have an opening in this area. A configuration of this type has the specific advantage that, because of the opening, the end of the output shaft facing away from the crank is accessible and the pressing procedure or the staking procedure can be performed with greater ease.

In a further development of the invention provision is made for the end of the output shaft facing away from the crank to be supported through the opening for press fitting and/or staking the output shaft to the crank. The ability to be thus supported simplifies the press fitting and/or staking process in an advantageous way.

In a further advantageous embodiment of the invention the opening can be closed specifically with a cover. The ability to close the opening ensures that humidity, dust or dirt can be effectively prevented from entering the gear housing.

To accomplish the object of the invention stated at the beginning, an inventive process to assemble a wiping device for wiping window glass on vehicles, having a wiper motor, a gear mechanism disposed on the input shaft of the wiper motor, a housing enclosing the gear mechanism, and having a crank located rotationally immovable on the gear output shaft is additionally envisioned, which provides for the output shaft to be pressed into a cylindrical hole in the crank and if necessary staked. The pressing can be carried out specifically by longitudinal pressing, shrinking or expanding.

Additional advantageous embodiments and details of the invention can be found in the following description, in which the invention is described in greater detail and explained on the basis of the embodiments shown in the drawing.

Figure 1 shows a wiping device in an isometric view from above and

Figure 2 shows the same wiping device in an isometric view from diagonally below.

In Figure 1 a wiping device 1 for wiping window glass on vehicles is shown, which has a wiper motor 2 and a gear mechanism located on the output shaft, which cannot be seen, of the wiper motor 2, which is enclosed by a gear housing 3. The gear housing 3 is rigidly attached to the wiper motor 2 with a means of fastening, such as a bolt 4 for example. Only a gear output shaft 6 of the gear located in the gear housing 3, which rides in a integral bearing insert 5 in the gear housing, is shown in Figure 1. Several stiffening ribs 7 are present in the gear housing 3 to stiffen the gear housing 3 in the area around the bearing insert 5.

A crank 8 is disposed rotationally immovable on the output shaft 6 at the free end of the output shaft 6 extending beyond the bearing insert 5. The output shaft-to-crank connection is a press fitting under the invention. The inner part of the press fitting is the output shaft 6 which is surrounded by the outer part of the press fitting, namely by a cylindrical hole 9 on the crank 8. The joint surface between the output shaft 6 and the cylindrical hole 9 is in this case cylindrical.

As an alternative to this, provision can also be made under the invention for the inner part to be a pin on the crank 8 and for the outer part to represent an axial cylindrical hole in the output shaft 6.

In the embodiment of the invention shown in Figure 1 the output shaft 6 is also staked to the crank 8. By means of such a staked connection the torque transmittable over the press fitting is increased and the crank 8 is additionally secured on the output shaft.

As can be clearly seen from Figure 1, the end face of the free end of the output shaft 6 together with the surface of the crank 8 facing away from the gear housing forms a largely plane surface geometry. With this the advantage is gained that bending the crank 8 because of a retaining element which must be disposed on

the crank in accordance with the prior art to retain the crank 8 to the output shaft 9 is not required. Instead, under the invention a swivel head 10 present on the side of the crank 8 facing away from the output shaft 6 can be coupled to a wiper linkage, which is specifically disposed parallel to the crank 8 and by means of which the wiper blades lying on the window glass of the vehicle can be driven. A special geometric adaptation or configuration of the crank 8 because of the rotationally immovable disposition of the crank 8 on the output shaft 6 is not necessary under the invention.

The gear housing 3 has in addition two threaded bosses 11, which are provided to attach the gear housing 3 with wiper motor 2 to the vehicle body.

A gear housing cover 12 which is configured to be removable is also shown in Figure 1.

In Figure 2, in which the wiping device 1 is seen from below, the full size of the gear housing cover 12 is clearly identifiable. The gear housing cover 12 has various holes 13, through which retaining bolts not shown can be inserted and tightened in the gear housing 3 to attach the gear housing cover 12 to the gear housing 3. To center the gear housing cover 12 to the gear housing 3, the gear housing cover 12 has a centering eye into which a centering pin located on the gear housing 3 can be engaged.

A cover 15 is also shown in Figure 2, which is furnished to cover an opening in the gear housing cover 12. The opening is located in the area in which the output shaft 6 extending through the gear housing 3 protrudes beyond the gear housing cover 12. To accommodate this end of the output shaft 6 the cover 15 has a raised bubble .

The embodiment of the invention shown and described in Figure 2 has the specific advantage that the end of the output shaft 6 facing away from the crank 8 is accessible and can be supported for the press fitting and staking of the output shaft 6 with the crank 8 by removing the cover 15. In this way the output shaft 6 can be press fitted or staked to the crank 8 without the need for removing the gear housing cover 12 from the gear housing 3. Under the invention it suffices if the removable cover 15 is removed from the gear housing cover 12 in order to install and support

the press and/or staking equipment on the end of the output shaft available under the cover 15.

All features shown in the description, the following claims and the drawing can be essential to the invention both individually and in any combination with each other.

What Is Claimed Is:

1. Wiping device (1) for wiping window glass on vehicles, having a wiper motor (2), a gear mechanism disposed on the input shaft of the wiper motor (2), a gear housing (3) enclosing the gear mechanism, a gear housing cover (12) disposed on the gear housing (3), an output shaft (6) and a crank (8) positioned rotationally immovable on the output shaft on the side of the gear housing (12) facing away from the gear mechanism, characterized in that the output shaft-to-crank connection is a press fitting.

2. Wiping device (1) in accordance with claim 1, wherein the inner part of the press fitting is the output shaft (6) and the outer part of the press fitting is a cylindrical hole (9) present in the crank (8).

3. Wiping device (1) in accordance with claim 1 and 2, wherein the output shaft (6) is staked to the crank (8).

4. Wiping device (1) in accordance with claim 3, wherein the cylindrical hole (9) in the crank has a chamfer, a cylindrical depression or an otherwise shaped recess on the side facing away from the gear housing (3).

5. Wiping device (1) in accordance with one of the preceding claims, wherein the output shaft (6) on the side facing away from the crank (8) extends into the area towards the gear housing (3) or gear housing cover (12) and the gear housing (3) or the gear housing cover (12) has an opening in this area.

6. Wiping device (1) in accordance with one of the preceding claims, wherein the end of the output shaft (6) facing away from the crank (8) can be supported through the opening for press fitting and/or staking the output shaft (6) to the crank (8).

7. Wiping device in accordance with claim 6, wherein the opening can be closed specifically with a cover (15).

8. Process for assembling a wiping device (1) for wiping window glass on vehicles, having a wiper motor (2), a gear mechanism disposed on the input shaft of the wiper motor (2), a gear housing (3) enclosing the gear mechanism, an output shaft (6) and a crank (8) disposed rotationally immovable on the output shaft (6), characterized in that the output shaft (6) is pressed into and if necessary staked into a cylindrical hole (9) present in the crank (8).

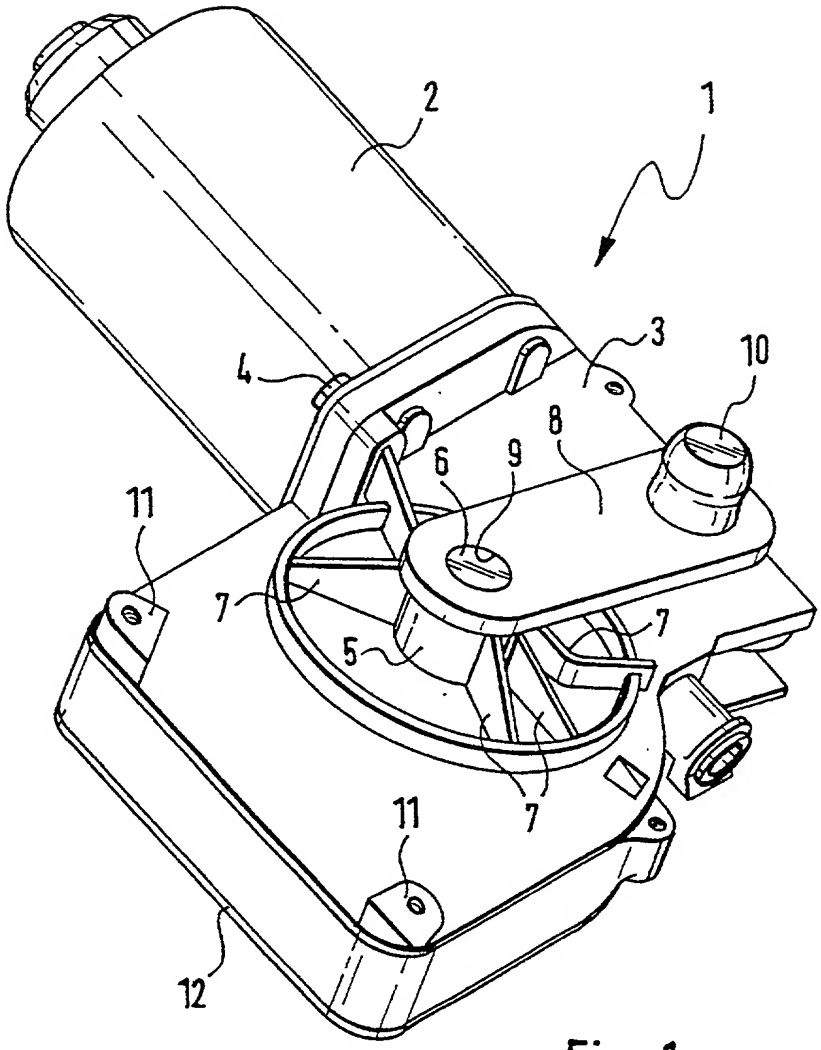

Fig. 1

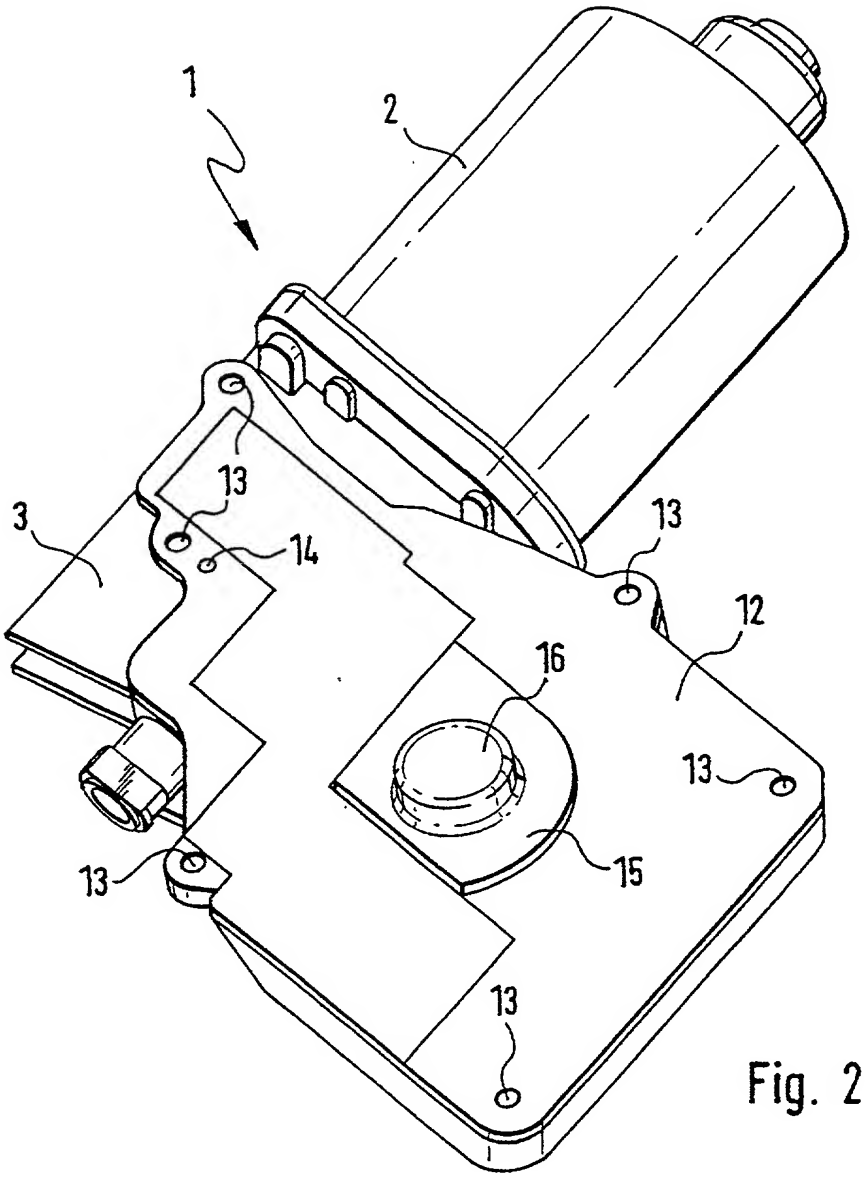

Fig. 2

SUBSTITUTE SPECIFICATION

Our Reference: VWP 0108 (VWP-514-A) PATENT

WIPING DEVICE

BACKGROUND

[0001] The invention relates to a wiping device for wiping window glass on vehicles, having a wiper motor, a gear mechanism disposed on the input shaft of the wiper motor, a gear housing enclosing the gear mechanism, a gear housing cover disposed on the gear housing, an output shaft and a crank located rotationally immovable on the output shaft on the side of the gear housing facing away from the gear mechanism. The invention additionally relates to a process for attaching the crank to the output shaft.

[0002] According to the generally known prior art, the crank is rotationally immovably secured to the output shaft by means of a threaded connector. To do this, the crank is installed onto the end of the output shaft facing the crank by means of an aperture present in the crank. The output shaft has a threaded section on its end onto which a retaining nut is threaded, by means of which the crank is frictionally connected to the output shaft.

[0003] Prior art of this type has the specific disadvantage that the retaining nut in its assembled state lies against the surface of the crank facing away from the gear housing. Because of the retaining nut, it is necessary to configure the crank in such a way that a wiper linkage connected to the crank at the free end of the crank by a swivel head is not obstructed by the retaining nut when the crank is rotating. In this situation, specific provision can be made for the crank to be bent in the direction away from the gear housing. To do this however, an extra bending step is required when making the crank, which is associated with complexity and cost. In addition, a bend of this type in the crank results in an uneven distribution of the compressive and tensile stresses in the crank because of the forces and torque to be transmitted with the crank.

[0004] The object of the invention is therefore to propose a wiping device in which a special configuration of the crank is not necessary because of the location of

the crank on the output shaft. The crank is still to be connected permanently to the output shaft in a way that ensures functional reliability.

SUMMARY

[0005] To accomplish the object, a wiping device of the type described at the beginning is proposed which envisions that the output shaft-to-crank connection is a press fitting.

[0006] A press fitting of this type has the specific advantage that no retaining nut on the surface of the crank facing away from the gear mechanism or any other retaining element is present to retain the crank on the output shaft. Instead, the end face of the output shaft ends flush with the crank, or does not extend beyond the surface of the crank. This renders a special configuration of the crank unnecessary because of a retaining element present on the surface of the crank. Under the invention the crank therefore does not need to be bent and can thus be configured flat.

[0007] In addition, an output shaft-to-crank connection in the form of a press fitting can be implemented easily and economically by mechanical means.

[0008] A further advantage of a connection of this type is that no additional components such as retaining nuts, threaded sections, washers or the like are needed to implement the output shaft-to-crank connection.

[0009] In a preferred embodiment of the invention the inner part of the press fitting is the output shaft and the outer part of the press fitting is a cylindrical aperture present in the crank. A press fitting of this design has the advantage that the output shaft already has a round cross section, so that only a cylindrical bore with matching tolerances has to be made in the crank. The joining surfaces are thereby cylindrical.

[0010] In a further development of the invention it is envisioned that the output shaft is staked to the crank. With a stake fitting of this type, for example, the area of the end face of the output shaft is plastically deformed and thereby displaced in such a way that the output shaft, at least over a short section, marginally grips the crank, or the cylindrical bore in the crank respectively, from behind. In order to make staking of this kind possible, provision can be made for the free end of the output shaft to protrude a very small amount through the cylindrical bore on the side of the

crank facing away from the gear housing and for the protruding section to be plastically deformed or displaced.

[0011] In a further development of the invention, provision is made for the cylindrical bore in the crank on the side facing away from the gear housing to have a chamfer, a cylindrical depression or an otherwise shaped cutout. A cylindrical bore configured in this way has the advantage that the staked section of the output shaft can be accommodated by the chamfer, the cylindrical depression or the otherwise shaped cutout. In this way, a smooth and flat surface on the crank is ensured even though the corresponding section of the output shaft is staked.

[0012] In another advantageous embodiment of the invention provision is made for the output shaft to extend into the area towards the gear housing or the gear housing cover on the side facing away from the crank, and for the gear housing or the gear housing cover to have an opening in this area. A configuration of this type has the specific advantage that, because of the opening, the end of the output shaft facing away from the crank is accessible and the pressing procedure or the staking procedure can be performed with greater ease.

[0013] In a further development of the invention, provision is made for the end of the output shaft facing away from the crank to be supported through the opening for press fitting and/or staking the output shaft to the crank. The ability to be thus supported simplifies the press fitting and/or staking process in an advantageous way.

[0014] In a further advantageous embodiment of the invention, the opening can be closed specifically with a cover. The ability to close the opening ensures that humidity, dust or dirt can be effectively prevented from entering the gear housing.

[0015] To accomplish the object of the invention above, an inventive process to assemble a wiping device for wiping window glass on vehicles, having a wiper motor, a gear mechanism disposed on the input shaft of the wiper motor, a housing enclosing the gear mechanism, and having a crank rotationally immovably located on the gear output shaft is additionally envisioned, which provides for the output shaft to be pressed into a cylindrical bore in the crank and if necessary staked. The pressing can be carried out specifically by longitudinal pressing, shrinking or expanding.

BRIEF DESCRIPTION OF THE DRAWING

[0016] Additional advantageous embodiments and details of the invention can be found in the following description, in which the invention is described in greater detail and explained on the basis of the embodiments shown in the drawing.

[0017] Figure 1 shows a wiping device in an isometric view from above; and

[0018] Figure 2 shows the same wiping device in an isometric view from diagonally below.

DETAILED DESCRIPTION

[0019] In Figure 1, a wiping device 1 for wiping window glass on vehicles is shown, which has a wiper motor 2 and a gear mechanism located on the output shaft, which cannot be seen, of the wiper motor 2, which is enclosed by a gear housing 3. The gear housing 3 is rigidly attached to the wiper motor 2 with a means of fastening, such as a bolt 4 for example. Only a gear output shaft 6 of the gear located in the gear housing 3, which rides in a integral bearing insert 5 in the gear housing, as is shown in Figure 1. Several stiffening ribs 7 are present in the gear housing 3 to stiffen the gear housing 3 in the area around the bearing insert 5.

[0020] A crank 8 is rotationally immovable disposed on the output shaft 6 at the free end of the output shaft 6 extending beyond the bearing insert 5. The output shaft-to-crank connection is a press fitting under the present invention. The inner part of the press fitting is the output shaft 6 which is surrounded by the outer part of the press fitting, namely by a cylindrical bore 9 on the crank 8. The joint surface between the output shaft 6 and the cylindrical bore 9 is in this case cylindrical.

[0021] As an alternative to this, provision can also be made under the invention for the inner part to be a pin on the crank 8 and for the outer part to represent an axial cylindrical bore in the output shaft 6.

[0022] In the embodiment of the invention shown in Figure 1, the output shaft 6 is also staked to the crank 8. By means of such a staked connection, the torque transmittable over the press fitting is increased and the crank 8 is additionally secured on the output shaft.

[0023] As can be clearly seen from Figure 1, the end face of the free end of the output shaft 6 together with the surface of the crank 8 facing away from the gear

housing forms a largely plane surface geometry. With this, the advantage is gained that bending the crank 8 because of a retaining element which must be disposed on the crank 8 in accordance with the prior art to retain the crank 8 to the output shaft 9 is not required. Instead, under the invention a swivel head 10 present on the side of the crank 8 facing away from the output shaft 6 can be coupled to a wiper linkage, which is specifically disposed parallel to the crank 8 and by means of which the wiper blades lying on the window glass of the vehicle can be driven. A special geometric adaptation or configuration of the crank 8 because of the rotationally immovable disposition of the crank 8 on the output shaft 6 is not necessary under the present invention.

[0024] The gear housing 3 has in addition two threaded bosses 11, which are provided to attach the gear housing 3 with wiper motor 2 to the vehicle body.

[0025] A gear housing cover 12 which is configured to be removable is also shown in Figure 1.

[0026] In Figure 2, in which the wiping device 1 is seen from below, the full size of the gear housing cover 12 is clearly identifiable. The gear housing cover 12 has various apertures 13, through which retaining bolts, not shown, can be inserted and tightened in the gear housing 3 to attach the gear housing cover 12 to the gear housing 3. To center the gear housing cover 12 to the gear housing 3, the gear housing cover 12 has a centering eye into which a centering pin located on the gear housing 3 can be engaged.

[0027] A cover 15 is also shown in Figure 2, which is furnished to cover an opening in the gear housing cover 12. The opening is located in the area in which the output shaft 6 extending through the gear housing 3 protrudes beyond the gear housing cover 12. To accommodate this end of the output shaft 6 the cover 15 has a raised bubble .

[0028] The embodiment of the invention shown and described in Figure 2 has the specific advantage that the end of the output shaft 6 facing away from the crank 8 is accessible and can be supported for the press fitting and staking of the output shaft 6 with the crank 8 by removing the cover 15. In this way, the output shaft 6 can be press fitted or staked to the crank 8 without the need for removing the gear housing

cover 12 from the gear housing 3. Under the present invention, it suffices if the removable cover 15 is removed from the gear housing cover 12 in order to install and support the press and/or staking equipment on the end of the output shaft available under the cover 15.

[0029] All features shown in the description, the following claims and the drawing can be essential to the invention both individually and in any combination with each other.

What is claimed is:

1. Wiping device (1) for wiping window glass on vehicles, having a wiper motor (2), a gear mechanism disposed on the input shaft of the wiper motor (2), a gear housing (3) enclosing the gear mechanism, a gear housing cover (12) disposed on the gear housing (3), an output shaft (6) and a crank (8) positioned rotationally immovable on the output shaft on the side of the gear housing (12) facing away from the gear mechanism, characterized in that the output shaft-to-crank connection is a press fitting.

2. Wiping device (1) in accordance with claim 1, wherein the inner part of the press fitting is the output shaft (6) and the outer part of the press fitting is a cylindrical hole (9) present in the crank (8).

3. Wiping device (1) in accordance with claim 1 and 2, wherein the output shaft (6) is staked to the crank (8).

4. Wiping device (1) in accordance with claim 3, wherein the cylindrical hole (9) in the crank has a chamfer, a cylindrical depression or an otherwise shaped recess on the side facing away from the gear housing (3).

5. Wiping device (1) in accordance with one of the preceding claims, wherein the output shaft (6) on the side facing away from the crank (8) extends into the area towards the gear housing (3) or gear housing cover (12) and the gear housing (3) or the gear housing cover (12) has an opening in this area.

6. Wiping device (1) in accordance with one of the preceding claims, wherein the end of the output shaft (6) facing away from the crank (8) can be supported through the opening for press fitting and/or staking the output shaft (6) to the crank (8).

7. Wiping device in accordance with claim 6, wherein the opening can be closed specifically with a cover (15).

8. Process for assembling a wiping device (1) for wiping window glass on vehicles, having a wiper motor (2), a gear mechanism disposed on the input shaft of the wiper motor (2), a gear housing (3) enclosing the gear mechanism, an output shaft (6) and a crank (8) disposed rotationally immovable on the output shaft (6), characterized in that the output shaft (6) is pressed into and if necessary staked into a cylindrical hole (9) present in the crank (8).

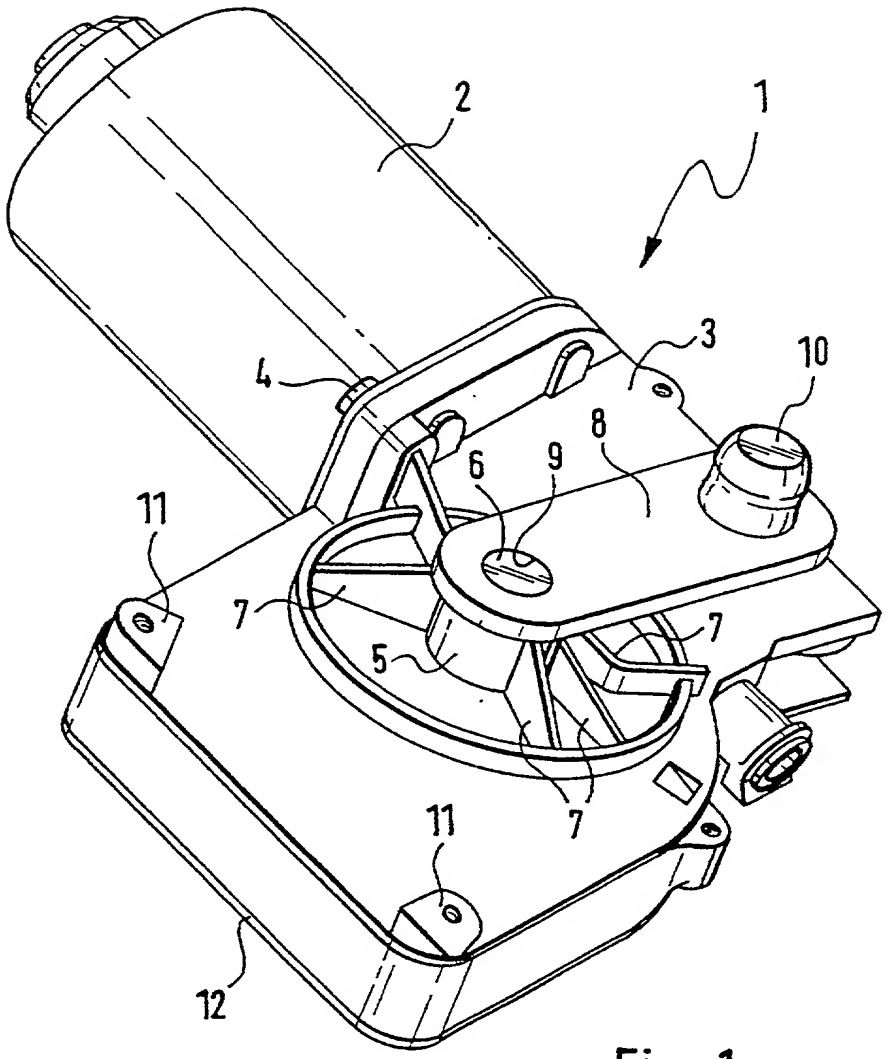

Fig. 1

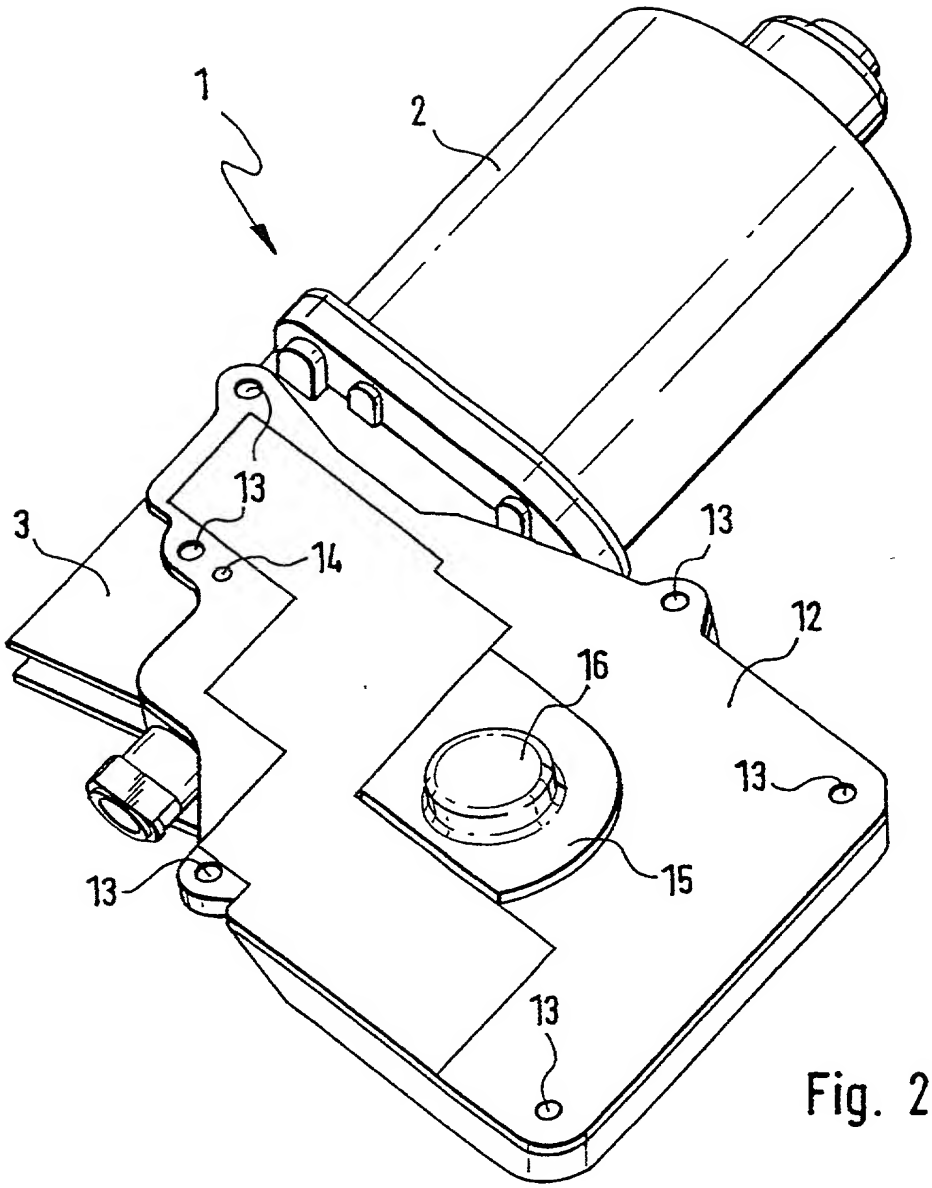

Fig. 2

Wiping Device

WIPING DEVICE

BACKGROUND Description

The invention relates to a wiping device for wiping window glass on vehicles, having a wiper motor, a gear mechanism disposed on the input shaft of the wiper motor, a gear housing enclosing the gear mechanism, a gear housing cover disposed on the gear housing, an output shaft and a crank located rotationally immovable on the output shaft on the side of the gear housing facing away from the gear mechanism. The invention additionally relates to a process for attaching the crank to the output shaft.

According to the generally known prior art, the crank is secured rotationally immovably to the output shaft by means of a threaded connector. To do this, the crank is installed onto the end of the output shaft facing the crank by means of an aperture present in the crank. The output shaft has a threaded section on its end onto which a retaining nut is threaded, by means of which the crank is frictionally connected to the output shaft.

Prior art of this type has the specific disadvantage that the retaining nut in its assembled state lies against the surface of the crank facing away from the gear housing. Because of the retaining nut, it is necessary to configure the crank in such a way that a wiper linkage connected to the crank at the free end of the crank by a swivel head is not obstructed by the retaining nut when the crank is rotating. In this situation, specific provision can be made for the crank to be bent in the direction away from the gear housing. To do this however, an extra bending step is required when making the crank, which is associated with complexity and cost. In addition, a bend of this type in the crank results in an uneven distribution of the compressive and tensile stresses in the crank because of the forces and torque to be transmitted with the crank.

The object of the invention is therefore to propose a wiping device in which a special configuration of the crank is not necessary because of the location of the crank on the output shaft. The crank is still to be connected permanently to the output shaft in a way that ensures functional reliability.

SUMMARY

To accomplish the object, a wiping device of the type described at the beginning is proposed which envisions that the output shaft-to-crank connection is a press fitting.

A press fitting of this type has the specific advantage that no retaining nut on the surface of the crank facing away from the gear mechanism or any other retaining element is present to retain the crank on the output shaft. Instead, the end face of the output shaft ends flush with the crank, or does not extend beyond the surface of the crank. This renders a special configuration of the crank unnecessary because of a retaining element present on the surface of the crank. Under the invention the crank therefore does not need to be bent and can thus be configured flat.

In addition, an output shaft-to-crank connection in the form of a press fitting can be implemented easily and economically by mechanical means.

A further advantage of a connection of this type is that no additional components such as retaining nuts, threaded sections, washers or the like are needed to implement the output shaft-to-crank connection.

In a preferred embodiment of the invention the inner part of the press fitting is the output shaft and the outer part of the press fitting is a cylindrical hole present in the crank. A press fitting of this design has the advantage that the output shaft already has a round cross section, so that only a cylindrical hole with matching tolerances has to be made in the crank. The joining surfaces are thereby cylindrical.

In a further development of the invention it is envisioned that the output shaft is staked to the crank. With a stake fitting of this type, for example, the area of the end face of the output shaft is plastically deformed and thereby displaced in such a way that the output shaft, at least over a short section, marginally grips the crank, or the cylindrical hole in the crank respectively, from behind. In order to make staking of this kind possible, provision can be made for the free end of the output shaft to protrude a very small amount through the cylindrical hole on the side of the crank facing away from the gear housing and for the protruding section to be plastically deformed or displaced.

In a further development of the invention, provision is made for the cylindrical hole in the crank on the side facing away from the gear housing to have a chamfer, a cylindrical depression or an otherwise shaped cutout. A cylindrical hole configured in this way has the advantage that the staked section of the output shaft can be accommodated by the chamfer, the cylindrical depression or the otherwise shaped cutout. In this way, a smooth and flat surface on the crank is ensured even though the corresponding section of the output shaft is staked.

In another advantageous embodiment of the invention provision is made for the output shaft to extend into the area towards the gear housing or the gear housing cover on the side facing away from the crank, and for the gear housing or the gear housing cover to have an opening in this area. A configuration of this type has the specific advantage that, because of the opening, the end of the output shaft facing away from the crank is accessible and the pressing procedure or the staking procedure can be performed with greater ease.

In a further development of the invention, provision is made for the end of the output shaft facing away from the crank to be supported through the opening for press fitting and/or staking the output shaft to the crank. The ability to be thus supported simplifies the press fitting and/or staking process in an advantageous way.

In a further advantageous embodiment of the invention, the opening can be closed specifically with a cover. The ability to close the opening ensures that humidity, dust or dirt can be effectively prevented from entering the gear housing.

To accomplish the object of the invention stated at the beginning, an inventive process to assemble a wiping device for wiping window glass on vehicles, having a wiper motor, a gear mechanism disposed on the input shaft of the wiper motor, a housing enclosing the gear mechanism, and having a crank located rotationally immovable on the gear output shaft is additionally envisioned, which provides for the output shaft to be pressed into a cylindrical hole in the crank and if necessary staked. The pressing can be carried out specifically by longitudinal pressing, shrinking or expanding.

BRIEF DESCRIPTION OF THE DRAWING

Additional advantageous embodiments and details of the invention can be found in the following description, in which the invention is described in greater detail and explained on the basis of the embodiments shown in the drawing.

Figure 1 shows a wiping device in an isometric view from above, and

Figure 2 shows the same wiping device in an isometric view from diagonally below.

DETAILED DESCRIPTION

In Figure 1, a wiping device 1 for wiping window glass on vehicles is shown, which has a wiper motor 2 and a gear mechanism located on the output shaft, which cannot be seen, of the wiper motor 2, which is enclosed by a gear housing 3. The gear housing 3 is rigidly attached to the wiper motor 2 with a means of fastening, such as a bolt 4 for example. Only a gear output shaft 6 of the gear located in the gear housing 3, which rides in a integral bearing insert 5 in the gear housing, as is shown in Figure 1. Several stiffening ribs 7 are present in the gear housing 3 to stiffen the gear housing 3 in the area around the bearing insert 5.

A crank 8 is disposed rotationally immovable on the output shaft 6 at the free end of the output shaft 6 extending beyond the bearing insert 5. The output shaft-to-crank connection is a press fitting under the present invention. The inner part of the press fitting is the output shaft 6 which is surrounded by the outer part of the press fitting, namely by a cylindrical hole 9 on the crank 8. The joint surface between the output shaft 6 and the cylindrical hole 9 is in this case cylindrical.

As an alternative to this, provision can also be made under the invention for the inner part to be a pin on the crank 8 and for the outer part to represent an axial cylindrical hole in the output shaft 6.

In the embodiment of the invention shown in Figure 1, the output shaft 6 is also staked to the crank 8. By means of such a staked connection, the torque transmittable over the press fitting is increased and the crank 8 is additionally secured on the output shaft.

As can be clearly seen from Figure 1, the end face of the free end of the output shaft 6 together with the surface of the crank 8 facing away from the gear housing forms a largely plane surface geometry. With this, the advantage is gained that bending the crank 8 because of a retaining element which must be disposed on

the crank 8 in accordance with the prior art to retain the crank 8 to the output shaft 9 is not required. Instead, under the invention a swivel head 10 present on the side of the crank 8 facing away from the output shaft 6 can be coupled to a wiper linkage, which is specifically disposed parallel to the crank 8 and by means of which the wiper blades lying on the window glass of the vehicle can be driven. A special geometric adaptation or configuration of the crank 8 because of the rotationally immovable disposition of the crank 8 on the output shaft 6 is not necessary under the present invention.

The gear housing 3 has in addition two threaded bosses 11, which are provided to attach the gear housing 3 with wiper motor 2 to the vehicle body.

A gear housing cover 12 which is configured to be removable is also shown in Figure 1.

In Figure 2, in which the wiping device 1 is seen from below, the full size of the gear housing cover 12 is clearly identifiable. The gear housing cover 12 has various apertures holes 13, through which retaining bolts not shown can be inserted and tightened in the gear housing 3 to attach the gear housing cover 12 to the gear housing 3. To center the gear housing cover 12 to the gear housing 3, the gear housing cover 12 has a centering eye into which a centering pin located on the gear housing 3 can be engaged.

A cover 15 is also shown in Figure 2, which is furnished to cover an opening in the gear housing cover 12. The opening is located in the area in which the output shaft 6 extending through the gear housing 3 protrudes beyond the gear housing cover 12. To accommodate this end of the output shaft 6 the cover 15 has a raised bubble .

The embodiment of the invention shown and described in Figure 2 has the specific advantage that the end of the output shaft 6 facing away from the crank 8 is accessible and can be supported for the press fitting and staking of the output shaft 6 with the crank 8 by removing the cover 15. In this way the output shaft 6 can be press fitted or staked to the crank 8 without the need for removing the gear housing cover 12 from the gear housing 3. Under the present invention it suffices if the removable cover 15 is removed from the gear housing cover 12 in order to install and support

the press and/or staking equipment on the end of the output shaft available under the cover 15.

All features shown in the description, the following claims and the drawing can be essential to the invention both individually and in any combination with each other.

What is claimed is:

What Is Claimed Is:

1. Wiping device (1) for wiping window glass on vehicles, having a wiper motor (2), a gear mechanism disposed on the input shaft of the wiper motor (2), a gear housing (3) enclosing the gear mechanism, a gear housing cover (12) disposed on the gear housing (3), an output shaft (6) and a crank (8) positioned rotationally immovable on the output shaft on the side of the gear housing (12) facing away from the gear mechanism, characterized in that the output shaft-to-crank connection is a press fitting.

2. Wiping device (1) in accordance with claim 1, wherein the inner part of the press fitting is the output shaft (6) and the outer part of the press fitting is a cylindrical hole (9) present in the crank (8).

3. Wiping device (1) in accordance with claim 1 and 2, wherein the output shaft (6) is staked to the crank (8).

4. Wiping device (1) in accordance with claim 3, wherein the cylindrical hole (9) in the crank has a chamfer, a cylindrical depression or an otherwise shaped recess on the side facing away from the gear housing (3).

5. Wiping device (1) in accordance with one of the preceding claims, wherein the output shaft (6) on the side facing away from the crank (8) extends into the area towards the gear housing (3) or gear housing cover (12) and the gear housing (3) or the gear housing cover (12) has an opening in this area.

6. Wiping device (1) in accordance with one of the preceding claims, wherein the end of the output shaft (6) facing away from the crank (8) can be supported through the opening for press fitting and/or staking the output shaft (6) to the crank (8).

7. Wiping device in accordance with claim 6, wherein the opening can be closed specifically with a cover (15).

8. Process for assembling a wiping device (1) for wiping window glass on vehicles, having a wiper motor (2), a gear mechanism disposed on the input shaft of the wiper motor (2), a gear housing (3) enclosing the gear mechanism, an output shaft (6) and a crank (8) disposed rotationally immovable on the output shaft (6), characterized in that the output shaft (6) is pressed into and if necessary staked into a cylindrical hole (9) present in the crank (8).

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro

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(81) Bestimmungsstaaten *(national)*: BR, CN, CZ, JP, KR, SK, US.

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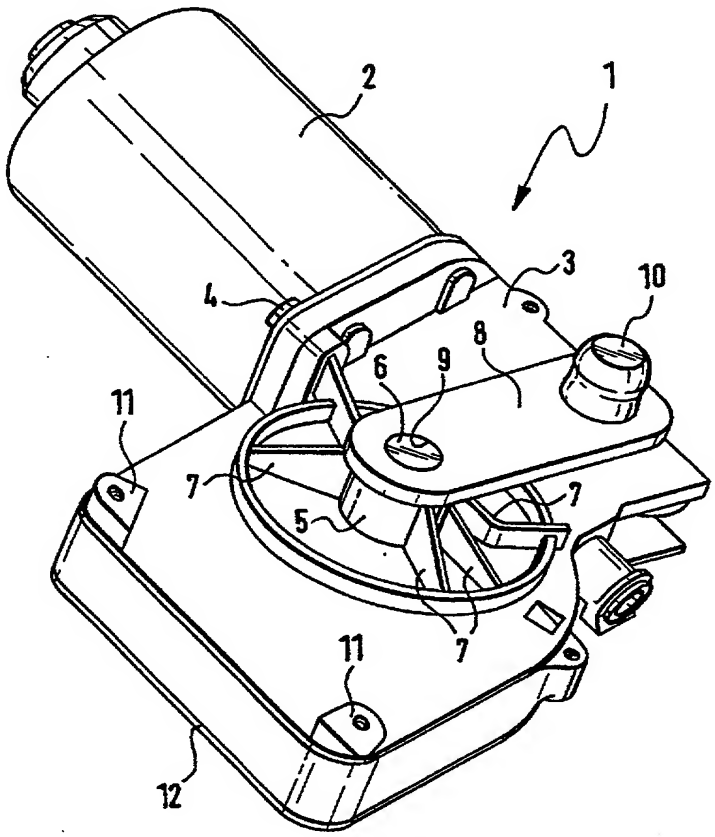
[Fortsetzung auf der nächsten Seite]

(54) Title: WIPING DEVICE

(54) Bezeichnung: WISCHEINRICHTUNG



(57) Abstract: The invention relates to a wiping device for wiping window panes on vehicles, comprising a wiping motor, a gear mechanism situated on the drive shaft of the wiper motor, a gear housing which surrounds the gear, a gear housing cover which is situated on the gear housing, a gear output shaft and a crank which is located on the gear output shaft on the side of the gear housing facing away from the gear, in a rotationally fixed manner. The invention is characterised in that the connection between the gear output shaft and the crank is a press connection.

(57) Zusammenfassung: Die Erfindung geht aus von einer Wischeinrichtung zur Wischung von Scheiben an Fahrzeugen, mit einem Wischmotor, mit einem an der Antriebswelle des Wischmotors angeordneten Getriebe, mit einem das Getriebe umgebenden Getriebegehäuse, mit einem an dem Getriebegehäuse angeordneten Getriebegehäusedeckel, mit einer Getriebeabtriebswelle und mit einer an der dem Getriebe abgewandten Seite des Getreibegehäuses an der Getriebeabtriebswelle drehfest angeordneten Kurbel. Die Erfindung zeichnet sich dadurch aus, dass die Getriebeabtriebswellen-Kurbel-Verbindung eine Pressverbindung ist.

WO 01/25065 A1

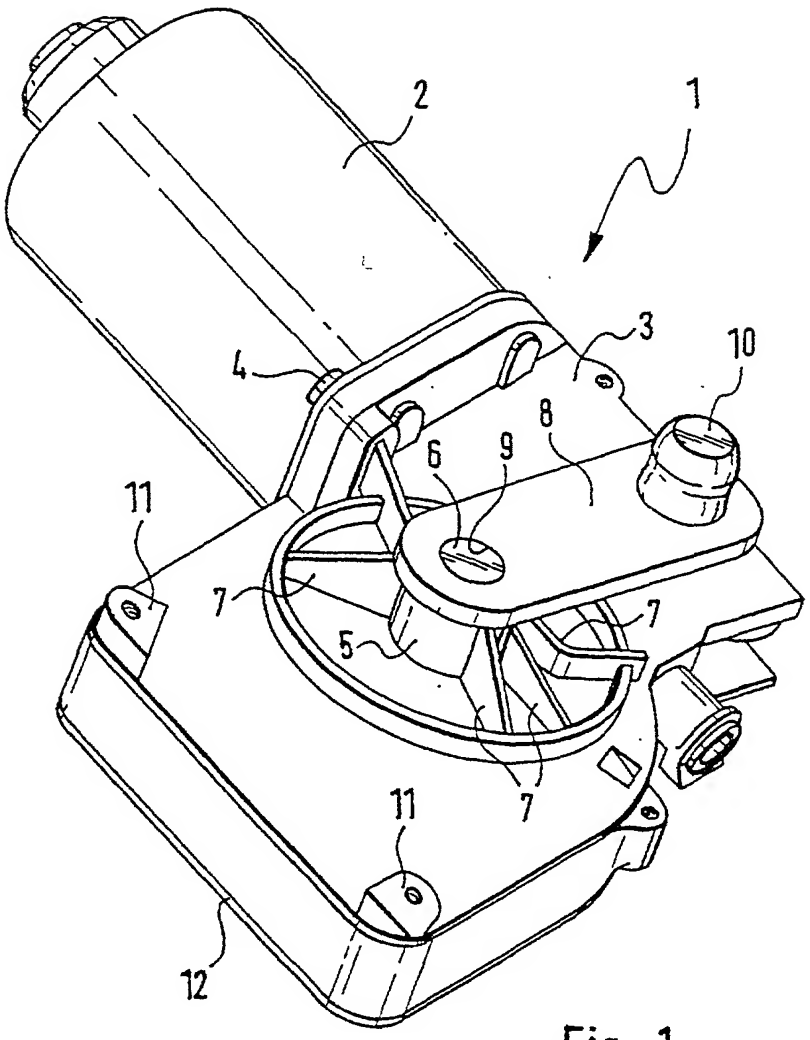


Fig. 1

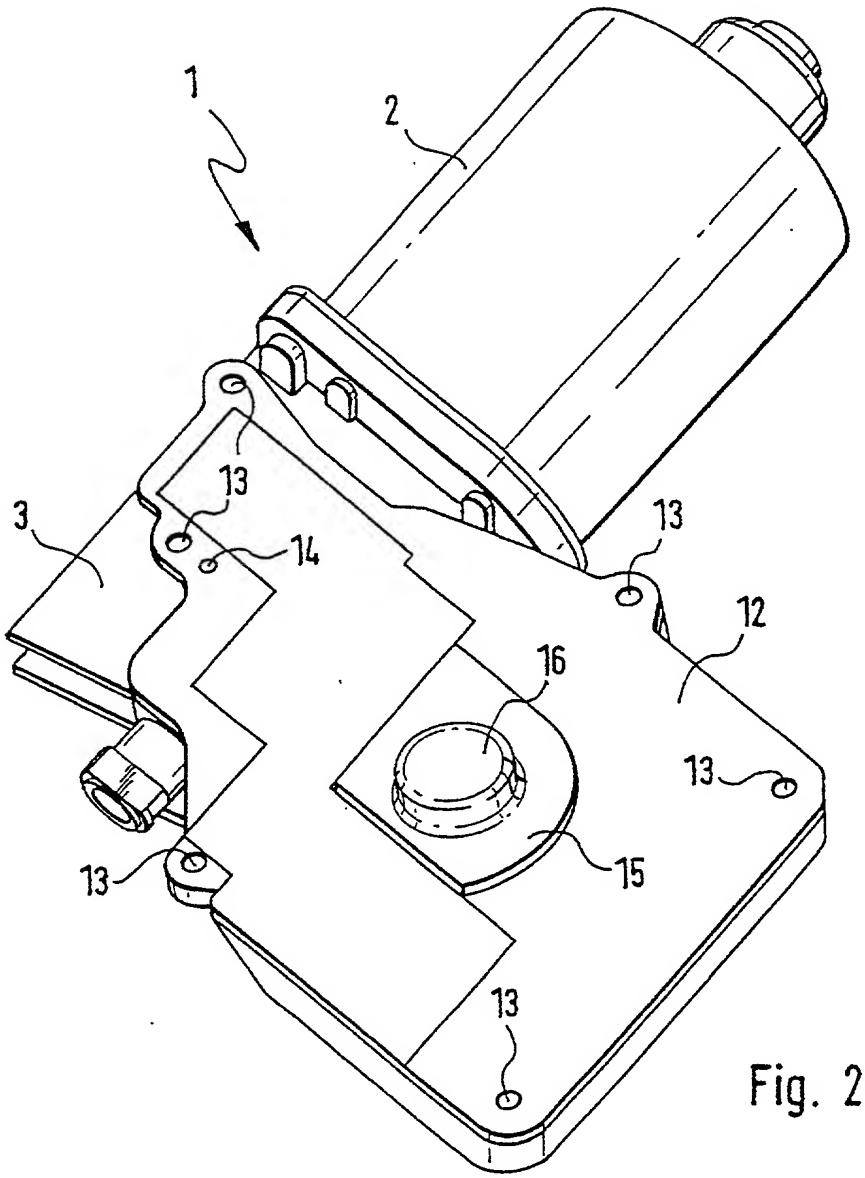


Fig. 2

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

To:

VALEO AUTO-ELECTRIC WISCHER UND MOTOREN GMBH
Mr. Jahn
Postfach 1763
74321 Bietigheim-Bissingen
ALLEMAGNE

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

Date of mailing (day/month/year) 25 June 2001 (25.06.01)	
Applicant's or agent's file reference 3826 573 Ste/spf	**IMPORTANT NOTIFICATION**
International application No. PCT/EP00/04600	**International filing date** (day/month/year) 20 May 2000 (20.05.00)

1. The following indications appeared on record concerning:

[ ] the applicant [ ] the inventor [X] the agent [ ] the common representative

Name and Address	State of Nationality	State of Residence
STEIMLE, Josef Dreiss Patentanwälte Postfach 10 37 62 70032 Stuttgart Germany	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[ ] the person [ ] the name [ ] the address [ ] the nationality [ ] the residence

Name and Address	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:
Please note the revocation of the above-mentioned agent of records. All further correspondence should be sent to the special address for correspondence as mentioned in the addressee Box.

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[ ] the International Preliminary Examining Authority
[X] the designated Offices concerned
[ ] the elected Offices concerned
[X] other: STEIMLE, Josef

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland** Facsimile No.: (41-22) 740.14.35	Authorized officer N. Wagner Telephone No.: (41-22) 338.83.38

Form PCT/IB/306 (March 1994)

004107843

Our Reference: WP 0180 (VWP-514-A)

COMBINED DECLARATION AND POWER OF ATTORNEY

DECLARATION:

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

WIPING DEVICE

the specification of which (check only one item below):

[] is attached hereto.

[] was filed as United States application Serial No. _____ on _____, and was amended on or through _____(if applicable).

[ ] was filed as PCT international application Number PCT/EP00/04600 on 20 May 2000, and was amended under PCT Article 19 on _____(if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate or §365(a) of any PCT international application(s) which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT international application(s) having a filing date before that of the application on which priority is claimed:

Prior Foreign/PCT Application(s) and any Priority Claims Under 35 U.S.C. §119:			Priority Claimed	
199 47 620.9	Germany	04 October 1999	[X]	[ ]
(Number)	(Country)	(Day/Mo/Yr Filed)	Yes	No
			[ ]	[ ]
(Number)	(Country)	(Day/Mo/Yr Filed)	Yes	No

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

(Application Number)	(Filing Date)
(Application Number)	(Filing Date)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or §365(c) of any PCT international application(s) designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Prior U. S. Application(s) or PCT International Application(s) Designating the U.S. for Benefit Under 35 U.S.C. §120:

(Application Number)	(Filing Date)	(Status: patented, pending, abandoned)
(Application Number)	(Filing Date)	(Status: patented, pending, abandoned)

POWER OF ATTORNEY:

I hereby appoint the following attorney(s) and/or agent(s) J. Gordon Lewis, Patent Office Registration No. 28735, Andrew R. Basile, Patent Office Registration No. 24753, William M. Hanlon, Jr., Patent Office Registration No. 28422, and Thomas D. Helmholdt, Patent Office Registration No. 33181, as my attorney(s) and/or agent(s), to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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